



August 1, 2002

Mary L. Cottrell, Secretary
Department of Telecommunications and Energy
One South Station - 2nd Floor
Boston, Massachusetts 02110

Re: Investigation into Distributed Generation, D.T.E. 02-38

Dear Secretary Cottrell:

Ingersoll-Rand Company Energy Systems Division ("Ingersoll-Rand") is pleased to have this opportunity to respond to the Department of Telecommunications and Energy's (the "Department") Request for Comments issued in connection with the Department's Order Opening Investigation into Distributed Generation dated June 13, 2002 (the "Order"). Ingersoll-Rand believes that the Department has appropriately recognized the importance of and potential benefits from distributed generation resources. As the Department has noted, distributed generation "has the potential to be a viable competitive alternative to customers in the restructured industry." Competitive Market Initiatives, D.T.E. 01-54, p.11 (2002). Such resources may also play a role in terms of load response. Id.; Order, p. 1.

Ingersoll-Rand's experience is consistent with the Department's earlier finding that "the lack of uniformity and uncertainty regarding interconnection standards and back-up rates could be inhibiting the installation of distributed generation in Massachusetts." Competitive Market Initiatives, D.T.E. 01-54, p. 11. Ingersoll-Rand believes that the Department's Request for Comments appropriately reflects the importance of, among other things, standardizing and streamlining interconnection procedures and agreements in order to foster the development of a fully competitive restructured electric market in Massachusetts. As discussed in more detail below, Ingersoll-Rand has commenced and is fully engaged in the manufacture, sales and service of distributed generation equipment. Therefore, our comments will focus on interconnection-related issues from the point of view of a distributed generation manufacturer and vendor that has learned that interconnection-related issues are, in fact, a major barrier to the success of distributed generation projects.

Ingersoll-Rand is a large diversified industrial firm and is a Fortune 500 Company. It manufactures, distributes and sells a wide variety of industrial equipment and components. In 2000, Ingersoll-Rand entered the distributed generation business by announcing plans to develop and market PowerWorks® microturbine systems. Ingersoll-Rand currently offers a 70 kilowatts ("KW") microturbine and will have a 250 KW microturbine available later this year. Ultimately Ingersoll-Rand expects to develop microturbines of up to 2 megawatts ("MW"). Ingersoll-Rand, in developing its microturbine line of products, has been able to draw on its expertise and long experience in providing power plant components for numerous defense applications.

The microturbines manufactured by Ingersoll-Rand are versatile. They can provide base-load power, can be used for peak shaving and can also utilize exhaust heat for other applications, such as hot water and cooling. The PowerWorks® microturbine can be integrated into mechanical/drive applications, such as compressed air, refrigeration and air conditioning equipment.

The PowerWorks® microturbines have low emissions on a pound per megawatt hour basis and are thermodynamically efficient, particularly when used in a co-generation, or combined heat and power mode. Ingersoll-Rand believes that the substantial environmental benefits associated with distributed generation resources should be reflected in relevant regulatory policy. Enclosed please find as Attachment A a brochure describing the PowerWorks® microturbine systems which can also be found at <http://www.irpowerworks.com>.

As Ingersoll-Rand moved into the distributed generation business, it identified and encountered a number of significant barriers that, if not removed, will greatly reduce the use of efficient, clean and secure distributed generation technologies. Unless such barriers are eliminated, electric customers in Massachusetts will be deprived of the economic, energy security, energy diversity, environmental, efficiency and reliability benefits that distributed generation technologies provide.

The major barriers to distributed generation have been analyzed and well documented by the United States Department of Energy ("DOE") in a study entitled Making Connections - Case Studies of Interconnection Barriers and their Impact on Distributed Power Projects, NREL/SR-200-28053 (National Renewable Energy Laboratory, May 2000, <http://www.eren.doe.gov/distributedpower/PDFs/28053.pdf>) (the "DOE Report"). A copy of the DOE Report is provided at Attachment B, and can also be found at <http://www.eren.doe.gov/distributedpower/PDFs/28053.pdf>. The DOE Report provides an excellent description of the real world barriers faced by distributed generation projects. Many of these barriers exist because of the very small size of distributed generation projects as compared to the large independent power producer projects now being developed across the country.

The DOE Report and Ingersoll-Rand's own experience establish that many of the interconnection-related barriers involve distribution system interconnection. For large projects, transaction costs involved in activities such as negotiating interconnection agreements and paying for interconnection studies as well as for the insurance

coverages required by utilities, can be spread across hundreds of megawatts, with little effect on the overall economics of a given project. However, that is not true for small distributed generation projects. As shown in the DOE Report, even costs of a few thousand dollars have a significant impact on the economics of small distributed generation projects and thereby render these clean and efficient projects uneconomic. For these reasons, Ingersoll-Rand submits that interconnection procedures and agreements for small distributed generation projects need to be standardized and simplified to minimize transaction costs. Accordingly, as discussed in greater detail below, Ingersoll-Rand encourages the Department to initiate such steps as may be necessary or appropriate in order to establish uniform and simplified interconnection procedures and agreements that recognize the specific circumstances of smaller projects.

Ingersoll-Rand shares the Department's views on the merits of targeted, collaborative processes as a means of accomplishing energy policy goals. See e.g. Customer Information Working Group established in D.T.E. 01-54-A; NOI-Gas Unbundling, D.T.E. 98-32. Ingersoll-Rand therefore recommends that the Department establish one or more working groups seeking to develop common interconnection standards and procedures for distributed generation projects and to address rate design issues relating to standby/back-up service. These groups should reflect the differing interests of distributed generation projects based on project size.

If this course is followed, Ingersoll-Rand strongly urges the Department to establish an expedited collaborative process that will focus upon very small distributed generation projects with the goal of developing a simplified, standardized interconnection agreement and simplified, standardized and technology neutral interconnection procedures for generation projects of 5 MW or less. Ingersoll-Rand believes that an expedited collaborative process is appropriate in this case given the successful results secured before the Department and other regulatory commissions on similar projects. For example, the Federal Energy Regulatory Commission ("FERC") used an expedited collaborative process in Docket No. RM02-1-000 Standardizing Generating Interconnection Agreements and Procedures. Consensus was reached relatively quickly upon a wide range of issues and procedures with relatively few issues left for resolution by the FERC. Ingersoll-Rand would expect that similar results could be achieved expeditiously by a committed working group in Massachusetts.

Ingersoll-Rand believes that the interconnection agreement and procedures applicable to small distributed generation projects should be significantly "scaled-down" versions of the standardized documents that the Department might develop for large projects. For small projects, these documents should reflect their far smaller impact on the interconnecting utility and the utility grid and the paramount need to minimize transaction costs. Ingersoll-Rand's experience has been that the regulatory process to date has generally not properly addressed the unique interconnection-related issues involved with small distributed generation projects.

Two common mistakes have been made in the past. First, the process of creating standard agreements and procedures typically seeks to develop a single model

for all distributed generation projects, large and small. Standard agreements considered in other proceedings, such as FERC docket RMO2-1-000, considered model interconnection procedures and agreements (e.g. ERCOT, EEI, etc.). While these models may be a good starting point, they generally are too burdensome for smaller projects. Ingersoll-Rand notes that the technical aspects of the ERCOT interconnection procedure should, however, form the basis for the technology standard for distributed generation projects of 4 MW or less. The documents prepared filed by the so-called Interconnection Agreement and Interconnection Procedures Drafting Group ("Drafting Group") in FERC docket RM 02-1-000 as consensus documents recognized and attempted to deal with some of the issues. But Ingersoll-Rand believes that even these proposals retain disproportionate burdens for small projects.

A second flawed approach advocated by some stakeholders is to grant small generators "exemptions" from some interconnection requirements. We agree for example, that certain standardized interconnection procedures and agreement should not cover distributed generation projects of 5 MW or less. However, merely exempting small projects from the standardized procedures and agreement requirements is not sufficient. Doing so would leave these projects in almost the same position that they are in today, where interconnection agreements are negotiated on a project-by-project, utility-by-utility basis, resulting in extremely high transaction costs for individual projects. In fact, smaller distributed generation projects with limited resources would be worse off than the larger projects that will have the benefit of any standardized interconnection standards and agreement. Accordingly, Ingersoll-Rand believes that the Department, and any working group established to address the issues raised in this proceeding, must develop clear standards that work for smaller projects.

Ingersoll-Rand is pleased to provide its comments and suggestions on certain of the specific questions raised within the Order.

1. Refer to current distribution company interconnection standards and procedures in Massachusetts. Do these standards and procedures act as a barrier to the installation of distributed generation? If so, please describe.
 - (a) If the current standards and procedures act as barriers to the installation of distributed generation, please describe what steps the Department should take to remove these barriers. As part of this response, please discuss whether the Department should establish uniform technical interconnection standards and procedures for distributed generation.
 - (b) Please comment on whether the Department should adopt the IEEE's uniform technical interconnection standards, or the uniform standards adopted by other states, for use in Massachusetts.

First, as mentioned above, Ingersoll-Rand does believe that current distribution company interconnection standards and procedures are a barrier to the installation of distributed generation resources. Ingersoll-Rand believes these barriers are of the same nature as those described in the DOE Report. Ingersoll-Rand encourages the

Department to take necessary and appropriate action to establish clear and uniform interconnection standards and procedures, particularly simple, streamlined standard procedures for small projects. Ingersoll-Rand believes that the establishment of a working group on this issue may be helpful and Ingersoll-Rand would be pleased to serve on such a working group. Ingersoll-Rand also believes that the recent draft National Association of Regulatory Utility Commissioners ("NARUC") Model Distributed Generation Procedures and Agreements should serve as the starting point for a working group.

Second, Ingersoll-Rand strongly encourages the Department to adopt the Institute of Electrical and Electronic Engineer's ("IEEE") standard for Distribution Resources Interconnected with Electric Power Systems. The IEEE's standards are reasonable and appropriate and the adoption of such a uniform standard will help to address many market barriers, including many of those described in the DOE report. Market participants would be able to rely upon the IEEE standards and the market would enjoy greater certainty. Such certainty would be expected to result in the substantial economic and societal benefits from distributed generation flowing to customers more rapidly.

2. Refer to current distribution company standby service tariffs. Do these tariffs act as a barrier to the installation of distributed generation? If so, please describe.
 - (a) Please discuss the appropriate method for the calculation of standby or back-up rates associated with the installation of distributed generation. As part of this response, please discuss whether other states have established policies regarding back-up rates associated with distributed generation that may be appropriate for adoption in Massachusetts.

Ingersoll-Rand believes that current standby/back-up service tariffs in Massachusetts create a barrier to the cost-effective installation of distributed generation. First, the lack of uniformity in terms of eligibility and pricing between utilities directly and adversely affects the marketing and availability of distributed generation programs. Second, rate design appears to have focused excessively upon administrative and demand charges rather than reflecting the actual and evolving cost causation factors of customers that rely upon modern distributed generation equipment. Ingersoll-Rand believes that standby/back-up rates should be carefully designed to reflect actual cost causation. The new generation of distributed generation equipment is highly reliable and, other than perhaps scheduled maintenance, will result in limited standby/back-up service requirements. Thus, energy-related costs should be the primary driver for standby/back-up service rate design.

Ingersoll-Rand also believes that standby/back-up rates should appropriately reflect distributed generator's cost effect upon a utility's distribution system. Customers that employ distributed generation equipment are only infrequently dependent upon transmission and distribution facilities. Moreover, the installation of this equipment has tangible countervailing system benefits to the utility, including the potential deferral of transmission and distribution system capital investments and lower transmission and

distribution system losses. These benefits should be reflected in the design of standby rates. Finally, standby/back-up rate design should, at worst, reflect a neutral incentive structure for the relevant utility with respect to distributed generation. Preferably, such rates could be designed so that distribution utilities would be encouraged to work with customers to secure the operational, societal and economic benefits associated with distributed resources. Ingersoll-Rand encourages the Department to direct distribution companies to implement or re-design standby/back-up rates that reflect the actual cost causation characteristics of customers employing distributed generation equipment.

3. Please discuss the role of distributed generation with respect to the provision of reliable, least-cost distribution service by the Massachusetts distribution companies.
 - (a) What steps should the distribution companies take in order to identify areas where the installation of distribution generation would be a lower-cost alternative to system upgrades and additions?
 - (b) What steps should the distribution companies take to encourage the installation of cost-effective distributed generation in their service territories?

Ingersoll-Rand believes that distributed generation resources can and should be an important component of a distribution company's plan to provide reliable, least-cost services. Ingersoll-Rand recognizes the Department's long standing leadership role and substantial achievements in the development of a market for conservation and load management ("C&LM") resources. Because of the Department's efforts, a substantial infrastructure has been developed for C&LM resources. In addition, customers have enjoyed significant economic, environmental and reliability benefits through the implementation of these programs, including the deferral or avoidance of major capital investments.

The market for distributed generation resources is still developing. For that market to be able to deliver substantial economic, reliability and environmental benefits, there must be a level playing field. Thus, distribution companies should be obligated to consider the numerous benefits provided by distributed generation resources in the course of all aspects of resource planning. For example, when conducting transmission or distribution planning, distribution companies should be required to consider the ability of distributed resources to defer or avoid the need for such investments. The distribution company's analysis should reflect the societal benefits of such resources in terms of reduced emissions, greater efficiency, enhanced security and the potential avoidance of construction and operational impacts. The Department should also require, at a minimum, that distribution companies provide a description of their plans to implement distributed generation programs within the forecast and resource plans filed regularly pursuant to G.L. c. 164, §69I.

Ingersoll-Rand also believes that the Department should seek to create opportunities for distribution companies and distributed generation proponents to work

together. A practice that has worked well in the past in Massachusetts is the use of "pilot" programs. Here, distribution companies could be required to set aside a modest amount to fund investment in distributed resources. Distributed generation providers would likely be more committed to working with Massachusetts utilities if there were meaningful development opportunities. Customers would benefit earlier from this new technology and project developers and distribution companies would become more familiar with each other's operational concerns so that future projects might proceed more expeditiously.

Ingersoll-Rand greatly appreciates this opportunity to comment upon the Department's efforts to foster a fully competitive electricity market and of encouraging efficient, environmentally sound, reliable and secure, and diverse energy sources. Ingersoll-Rand believes that distributed generation resources will, if given a fair opportunity, provide substantial benefits to Massachusetts taxpayers and citizens and encourages the Department to take expeditious action to eliminate the market barriers that currently frustrate development. [Ingersoll-Rand would be interested in addressing these comments and any questions of the Department at the public hearing scheduled in this proceeding.

Thank you for your consideration.

Very truly yours,

INGERSOLL-RAND COMPANY

By: _____
Thomas J. Williams
Assistant General Counsel

Enclosures

cc: William H. Stevens, Jr., Esq.

ATTACHMENT A

Brochure Describing PowerWorks® Microturbine Systems

ATTACHMENT B

DOE Report